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ABSTRACT

This report is part of a series of special topic reports developed by the Chicago Annenberg Research Project to document key issues and problems affecting the Chicago Annenberg Challenge and the improvement of Chicago public schools in general. The report introduces the concept of instructional program coherence and explains why schools whose improvement efforts show strong coherence are more likely to advance. It presents research showing that students in Chicago elementary schools with stronger program coherence have higher gains in academic achievement. It also shares observations on how, in specific schools, principals, external partners, and other agencies direct, or fail to direct, key school resources toward more coherent instruction. It ends by discussing factors within the educational system that discourage instructional program coherence, suggesting ways that school leaders, school improvement partners, and policymakers can bring about instructional coherence that will reward their school improvement efforts. Five chapters present: (1) "The Problem: Too Many Unrelated, Unsustained 'Improvement' Programs"; (2) "What Is Instructional Program Coherence?" (3) "Is Instructional Program Coherence Related to Student Achievement: Survey Results"; (4) "Organizing Instructional Program Coherence in Schools: Field Study Results"; and (6) "Interpretive Summary." Overall, research shows that schools ranking high on instructional program coherence have stronger principal leadership, while lower ranking schools allow teachers more individual autonomy and the discretion to select their own curriculum materials and strategies for instruction and assessment. An appendix presents the statistical analysis. (Contains 43 references.) (SM)

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Improving Chicago's Schools

Consortium on
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A Report of the
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School Instructional Program Coherence: Benefits and Challenges

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Improving Chicago's Schools

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Executive Summary

A large array of urban school improvement grants, programs, and partnerships enables schools to embrace multiple improvement initiatives in an effort to improve student achievement. This report discusses an important reason why schools involved in many reform efforts do not always improve their students' achievement.

We introduce the concept of *instructional program coherence* and explain why schools whose improvement efforts show strong coherence are more likely to advance. We present new evidence showing that students in Chicago elementary schools with stronger program coherence show higher gains in student achievement. We also share observations on how, in specific schools, principals, external partners, and other agencies direct, or fail to direct key school resources toward more coherent instruction. In closing, we discuss factors within the educational system that discourage instructional program coherence, and suggest ways in which school leaders, school improvement partners, and policy makers can act to bring about the instructional coherence that will reward their school improvement efforts.

School Instructional Program Coherence: Benefits and Challenges

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Foreword

In 1993, Ambassador Walter Annenberg announced a $500 million challenge grant to improve public education in the United States. Cities wishing to receive a portion of that grant were invited to submit proposals describing how the funds would be used to stimulate educational innovation and collaboration in their public school systems. A group of Chicago school reform activists and education stakeholders, including parents, teachers, principals, community leaders, and foundation officers, organized to write a proposal to include Chicago among the sites receiving a grant. They were successful. In January 1995, the Annenberg Foundation awarded a five-year grant of $49.2 million to establish the Chicago Annenberg Challenge. An additional $100 million in matching funds was pledged by local donors.

The Chicago Annenberg Challenge was organized to distribute and manage these monies among networks of schools and external partners throughout the city. Its mission is to improve student learning by supporting intensive efforts to reconnect schools to their communities, restructure education, and improve classroom teaching. The Chicago Challenge funds networks and external partners that seek to develop successful, community-based schools that address three critical education issues through whole-school change: school and teacher isolation, school size and personalism, and time for learning and improvement. More than half of Chicago's public schools will have participated in an Annenberg-supported improvement effort by the end of the grant period in 2001.

This report is part of a series of special topic reports developed by the Chicago Annenberg Research Project. This series focuses on key issues and problems of relevance to the Chicago Annenberg Challenge and to the improvement of Chicago public schools generally. It complements a series of technical reports that focus specifically on the work and accomplishments of the Chicago Annenberg Challenge. Among

the topics examined to date in the special topics report series are the quality of intellectual work in Chicago elementary schools; social support, academic press, and their relationship to student achievement; and, in this report, school instructional program coherence.

The work of the Chicago Annenberg Research Project is intended to provide feedback and useful information to the Chicago Challenge and the schools and external partners who participate in its efforts to improve educational opportunities for Chicago's children and youth. This work is also intended to expand public discussion about the conditions of education in the Chicago Public Schools and the kinds of efforts needed to advance meaningful improvements. This effort to stimulate new avenues of discussion about urban school improvement is an important aspect of Ambassador Annenberg's challenge to engage the public more fully in school reform.

Acknowledgments

Many organizations and individuals contributed to this report. The authors are deeply grateful for their assistance.

The Chicago Annenberg Challenge provided the primary funds for the study and for the development and distribution of the report.

Fourteen Chicago Annenberg Research Project researchers worked in 1996-1997 to collect data on schools and the agencies that affect them. Staff from the Chicago Public Schools have consistently cooperated in providing achievement data.

Mark A. Smylie, Stacy Wenzel, John Q. Easton, and other members of the Lead Team of the Chicago Annenberg Research Project gave important counsel during all phases of the report, from planning through publication. Special thanks to David Kerbow for the original item development for the program coherence scale, and to Stuart Luppescu and Jenny Nagaoka for subsequent psychometric analyses on this scale.

Cora Marrett, Deborah Stipek, and Leona Shauble provided useful feedback on parts of the manuscript.

The report depended on the cooperation of staff in Chicago Annenberg schools who offered access to researchers and gave much of their time to tell us about their work in school improvement.

Sarah-Kay McDonald, Sandra Jennings, and Carolyn Saper provided production, design, and editorial services. The photographs are by John Booz.

John Booz

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I. The Problem: Too Many Unrelated, Unsustained 'Improvement' Programs

A TV newscaster, on assignment to publicize progress in urban school reform, is explaining why he selected Travis Elementary School for his story:[1]

> "There's so much happening. The teachers are a great group and their principal is always getting them new programs and equipment. The entryway has plaques, commendations, pictures and letters to show all the activities they are involved in. It lists all the school improvement initiatives, too. For reading alone they have Reading Recovery, SRA, Great Books, Accelerated Reader, Drop Everything and Read (DEAR), and Links to Literacy. The mathematics initiatives include Plato, The Algebra Project, Family Math, and a new textbook series. The school has programs with over a dozen social service partners and community groups. Lots of the faculty sponsor special programs for the kids, too. Gosh, I remember when I used to visit these urban schools and they seemed like graveyards where nothing was happening and few were trying."

The reporter's positive comments were appreciated, but people more familiar with Travis knew that, in spite of all the hard work and innovation, student scores in reading and mathematics remained far below the district's performance standards. The principal and teachers attended meetings and conferences to take advantage of new opportunities, but many staff members were tired and frustrated. One teacher said:

> "Some Saturday mornings I can't remember which workshop I'm supposed to go to. I know it's a bad weekend when I'm supposed to be at two at once. Or, when what they tell us to do at one

workshop is the opposite of what was suggested at the last. In class, I just try out bits of each as best I can."

Travis' principal respected her teachers and worked tirelessly to bring them new resources and ideas:

"My teachers are doing their absolute best. They're trying terribly hard, most of them. There's so much out there to do. And I keep finding more, and asking them to do more. Sometimes I feel like we're juggling too many balls in the air, and either we're going to drop the balls, or we're going to be so tired, and pulled in so many directions, we're the ones who are going to drop."

The story of Travis reflects a trend among many urban schools, including schools in Chicago. On the one hand, administrators and teachers want to adopt programs and materials that might help them teach more effectively. On the other, there are so many meetings and workshops, that staff express not only fatigue, but also professional frustration. They find themselves faced with a large and fragmented array of school improvement grants, programs, and partnerships that rarely afford them the time or support to adopt and master practices that may improve student learning.

John Booz

Principals are caught in a bind. Some recognize that their faculty might be "juggling too many balls." On the other hand, they also know that they cannot expect their schools to improve if everything stays the same. Hooking up with multiple improvement initiatives often seems the only way to bring needed resources to a school and to promote the work and commitment of staff with very different interests or strengths. Moreover, the emotional and social needs of many of their students are enormous, far beyond what a school can address on its own. For this reason, partnerships with external organizations seem essential. Even when principals recognize that their teachers are stretched in too many directions, they seem unable to cut programs, believing strongly that they need all of these extra resources to help the children.

Research has documented the importance of school organizational factors such as a unity of purpose, a clear focus, and shared values for student learning. Research has also drawn attention to the problem of incoherent school programs, where diverse initiatives set up to serve important needs, but which lack the sustained attention of the majority of staff within the school, have no apparent effects on the core goal of improving student achievement. Earlier Consortium research focused specific attention on the problems of "Christmas tree" innovations; that is, change or improvement strategies that bring attention to a school through numerous program and equipment purchases but fail to build its capacity to improve teaching and learning.[2] Other research has pointed out how cluttered and contradictory state and district policy environments also fragment school development efforts. All this implies the need for instructional program coherence.[3]

Research has not, however, addressed how administrators and teachers might actually rethink their circumstances and bring greater coherence to their efforts. For example, research into school improvement in

Chicago has highlighted the importance of five essential supports to guide school improvement: school leadership, parent and community involvement, professional community, a student-centered learning climate, and high quality instruction.[4] Schools can, however, approach the development of these supports in more or less coordinated ways, and each support could be present without strong instructional program coherence. To address this issue, we offer a clear operational definition for instructional program coherence and we illustrate how some schools in Chicago achieved greater coherence than others.

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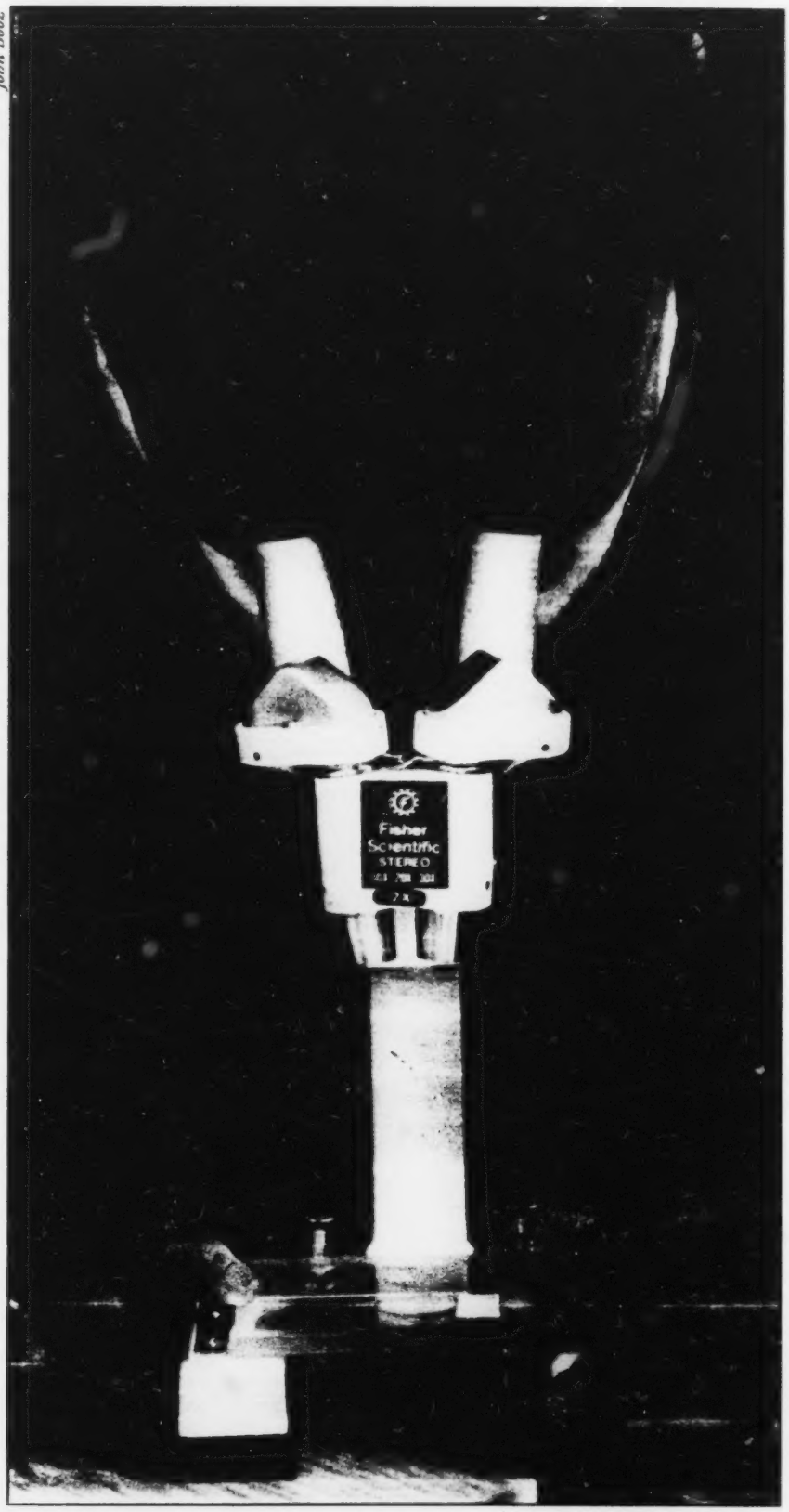

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II. What is Instructional Program Coherence?

Strong program coherence is evident when three major conditions prevail in a school.

1. A common instructional framework guides curriculum, teaching, assessment, and learning climate. This framework combines specific expectations for student learning with specific strategies and materials to guide teaching and assessment.

One example of this, observed in Annenberg school sites, is the Cunningham approach to literacy. This framework provides grade-aligned curriculum, instructional strategies, and assessments. It specifies that all literacy learning activities be organized into four areas: guided reading, self-selected reading, working with words, and writing.[5] Another example is the Success for All approach to mathematics instruction which provides grade-aligned curriculum, makes learning expectations clear (for example, students must engage in mathematical reasoning in situations beyond school), and specifies effective instructional strategies for particular types of learning, such as manipulatives to represent concepts or symbols, and cooperative learning methods for problem solving.[6] Schools can, of course, develop their own instructional frameworks, rather than adopting one from an external source.

More specifically,

- Curriculum, instructional strategies, and assessments of students are coordinated among teachers within a grade level.

- Curriculum and assessments of students proceed logically from one grade level to the next and offer a progression of increasingly complex subject matter rather than repeating rudimentary material previously taught.

- Key student support programs, such as tutoring, remedial instruction, parent education, and opportunities for parental involvement, are aligned with the school's instructional framework.

2. Staff working conditions support implementation of the framework.

- Administrators and teachers expect one another to implement the framework.
- Criteria for recruiting and hiring teachers emphasize commitment to and competence in executing the framework.
- Teachers are evaluated and held accountable in large part on the extent to which they effectively use the common instructional framework.
- Professional development opportunities for staff are focused on the common instructional framework, and are pursued over a sustained period of time.

3. The school allocates resources such as materials, time, and staff assignments to advance the school's common instructional framework and to avoid diffuse, scattered improvement efforts.

- Curriculum and student assessments remain stable over time.
- Similarly, teachers' professional assignments are stable enough, so that teachers have sustained opportunities to learn how to teach well in their specific roles.

The concept of coherence has surfaced in many different discussions of school improvement, most notably on issues of curriculum. Calls for coherent curriculum ask primarily for sensible connections among the topics that students study in each subject within a grade and as they advance through the grades. Instructional program coherence includes curricular coherence, but entails several other criteria as well.

Coherence has also been interpreted as alignment of the school's instructional program with external policies and standards. Our definition does not stipulate this type of alignment, because external policies or mandates could promote, undermine, or have no effect on the degree of instructional program coherence within a school. Whether alignment with external policy promotes instructional coherence within a school depends upon the nature of the external policies. For example, as we look across the country we see numerous instances where school alignment with the following policies might exacerbate program incoherence: (a) the state mandates curriculum standards that call for student mastery of hundreds of discrete competencies with no common themes or skills connecting them; (b) the district recommends that all elementary teachers participate in one-day workshops on portfolio assessment, classroom management, higher order thinking, guided reading, and culturally responsive teaching; (c) the state develops tests which stress extended written performance, but within two years abandons these tests, and then, after two years of no state testing, issues new tests measuring recall of knowledge through multiple choice responses. In contrast, district policy could assist instructional program coherence by requiring elementary schools to adopt a research-based model of literacy instruction and by supporting extensive professional development for school teams to help them gain mastery in this approach.

As indicated in the above examples, any single policy could promote instructional program coherence to a greater or lesser degree. It is important to recognize that schools are subject to a *mix* of policies that emanate from different authorities and stakeholders. This too affects coherence within schools. Critics arguing for systemic reform have emphasized the need for tighter coordination among local, state, and federal policies dealing with everything from assisting students with special needs and incentives for school improvement, to teacher certification, professional development, and accountability mechanisms. Efforts to coordinate such policies among different parts of the policy system could increase instructional program co-

herence within schools if the individual policies themselves reinforce coherence.

Why Should Instructional Program Coherence Promote Student Achievement?

Several lines of theory and research suggest that instructional program coherence should assist student achievement. This can occur both by helping teachers work more effectively on problems of school improvement, and by directly increasing student engagement and learning.

John Booz

Assisting Student Learning and Engagement

Research on learning and cognition indicates that students at all ages are more likely to learn when their experiences connect with and build upon one another. To the extent that experiences are disconnected, it is more difficult for students to incorporate new understanding into prior knowledge and to alter prior knowledge when necessary. Studies in cognitive science indicate that learning takes time and requires recurring opportunities to practice and to apply knowledge and skills in new contexts. Material learned through short-term exposure and only in reference to a limited context, is less likely to be retained and transferred to other settings.[8] For example, students are more likely to learn how to use and appreciate fractions if they see how fractions are applied to a variety of problems, such as clocking their running time in school races or mixing the right color paint for their drawings.

Compared to disconnected short-term experiences, integrated experiences, sustained long enough for successful completion, provide greater clarity about what is required for mastery, and how prior knowledge can be applied to future questions. Students learning to read, for example, are more likely to gain basic skills, and the confidence to tackle more challenging tasks, in settings where all of their teachers assist their reading in a consistent manner. In contrast, when there is little connection between prior, present, and future activities, and when experiences are too brief to allow for mastery, it is more difficult for students to process the information.

Most of the research on the importance of connected learning experiences, and the application of ideas across multiple contexts, comes from research on instruction within classrooms. But, it is reasonable to assume that these theories and insights also apply to learning that occurs across different classrooms and to learning that occurs as students move from one grade to the next.

Research on motivation suggests that students are more likely to engage in the difficult work of learning when curricular experiences within classes, among classes, and over time are connected to one another. As explained above, coherent instruction develops competence more effectively than incoherent instruction. When children see themselves developing competence, they are more motivated to work, because fulfilling the basic human need for mastery builds confidence that exerting effort will bring success. In contrast, when faced with incoherent activities, students are more likely to feel that they are the target of apparently random events, and that they have less knowledge of what should be done to be successful. This reduces student engagement in the hard work that learning often requires. Thus, incoherent activities undermine opportunities to gain mastery and the confidence that motivates further learning.[9]

Together these points suggest that where curriculum, instruction, and special programs are coordinated, one could expect enhanced student achievement. Compared to uncoordinated and short-term learning experiences, more coherent experiences can provide absorbing activities that increase students' motivation to engage in the difficult work of learning. They also offer more opportunities for cognitive processing, because knowledge and skills previously acquired can be used to achieve mastery in new areas.

Assisting Teacher Effectiveness

Instructional program coherence might also be expected to assist teacher learning and effectiveness. According to the research on learning and motivation summarized above, teachers who participate in coherent professional development experiences, as opposed to short-term, unrelated activities, are also more likely to learn from those experiences and to integrate that new knowledge into their teaching. In addition, research on organizations and effective management indicates that professionals who work together on integrated activities aimed at clear goals produce higher quality goods and services.[10]

There are at least two reasons for the increased quality achieved in these settings. First, coordination of activity amplifies workers' access to and use of technical resources and expertise. For example, if teachers within a grade level pool their knowledge on the most effective ways to use cooperative learning in the study of mathematical estimation, each teacher has an opportunity to improve his or her skill. Second, connecting the work of different teachers to common purposes, activities and practices that are pursued over an extended period gives teachers' work more meaning, thereby increasing their motivation and commitment to reach goals. In contrast, when a teacher knows from prior experience that ideas and initiatives are often introduced and then quickly abandoned, it makes little sense to expend much effort to change one's practice.

John Booz

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More generally, these points on student learning and engagement, and on teacher effectiveness are consistent with research on school effectiveness. This includes studies on total quality management, effective schools, high-capacity schools, Catholic high schools, and the differences between public and private schools. Such studies suggest a set of key factors that can lead to higher school performance.[11] These factors include the importance of a sustained organizational focus, staff agreement on clear and specific goals, more common academic expectations and curriculum for all students, teacher collaboration and collective responsibility for meeting goals, and a consistent climate of positive supports and high expectations for all students and staff. Each of these is reflected in one or more of the indicators we propose for instructional program coherence.

How We Did the Study

Survey and Achievement Data

To study the relationship between school program coherence and student achievement, we needed measures of instructional program coherence and the academic achievement levels of students within those schools.

Sample

The Consortium teacher surveys in 1994 and 1997, which included items on instructional program coherence, were distributed to teachers in all Chicago public elementary schools. We merged these survey data with the Iowa Tests of Basic Skills in Reading and Mathematics for all students in grades 2 through 8 in these schools. Our research used data from the 222 elementary schools that participated in the surveys in both years. This involved 5,358 teachers in 1994 who had valid responses on the coherence items, and 5,560 teachers in 1997, with an average of 24 teachers per school per year in 1994 and 25 teachers per school in 1997. The number of students who took the tests varied between grade levels, years, and the subjects of reading and mathematics, but the average number of students taking the tests in any year was 81,493, with an average of 367 students per school.

Measuring Instructional Program Coherence

The survey items used to construct measures of teachers' perceptions of school program coherence are listed below. The number of items on this topic was expanded in the 1997 survey over those asked in 1994. To allow for a direct comparison of teachers' responses from 1994 to 1997, we mathematically equated common items in the two surveys through Item Response Theory, using Rasch Rating Scale analysis.[1] The 1994 and 1997 measures were then fit to a common 10-point scale. Teachers' responses were averaged in each school to produce a measure of each school's level of instructional program coherence in both 1994 and 1997.[2]

Items in the 1994 survey. To what extent do you agree or disagree with each of the following statements (strongly disagree, disagree, agree, strongly agree)?

- You can see real continuity from one program to another in this school.
- Many special programs come and go in this school (reverse scored).
- Once we start a new program, we follow up to make sure that it's working.
- We have so many different programs in this school that I can't keep track of them all (reverse scored).

Additional Items in the 1997 Survey. To what extent do you agree or disagree with each of the following statements (strongly disagree, disagree, agree, strongly agree)?

- Curriculum, instruction, and learning materials are well coordinated across the different grade levels at this school.
- There is consistency in curriculum, instruction, and learning materials among teachers in the same grade level at this school.
- Most changes introduced at this school have little relation to teachers' and students' real needs and interests.
- Most changes introduced at this school help promote the school's goals for learning.
- To what extent have coordination and focus of the school's instructional program changed in the past two years at your school (worse, no change, better)?

Student Achievement Measures

Academic achievement was measured through the Iowa Tests of Basic Skills (ITBS) in reading and in math. For each year, from 1993 to 1997, we calculated the average achievement of students in each of the sample schools. Achievement scores were computed in logits, based on an item response theory equating of the different forms and test levels of the ITBS used by the Chicago Public Schools during this

period.[3] Because these scores are difficult to interpret, the results were converted into a metric that represents a "year of learning." On average, students' test scores increased by just under .6 logits per year (.52 in reading and .59 in math). Therefore, we considered each .6 logit change as equivalent to one year of learning. This number is approximate, however, as the average gain per year is different by grade level and year of testing, ranging from .4 to .7 logits per year.

Field Study

Sample

To gain a deeper understanding of the role of instructional program coherence in school improvement, researchers visited 11 elementary schools participating in the Chicago Annenberg Challenge (CAC) in 1996-1997. The 11 schools represented a diversity of approaches to school improvement among CAC external partners as well as the demographic diversity of the Chicago Public Schools. Six of the schools enrolled primarily African American students, two enrolled primarily Latino students, and three enrolled racially mixed student populations with Latino majorities. They were located in different neighborhoods reflecting a range of socioeconomic resources. Most, however, struggled against high rates of poverty and social stress.

Data Collection

Each school was visited and studied by a two-person research team during the 1996-97 school year. The research team observed classes in grades three, six, and eight, as well as staff meetings and other school activities. It conducted interviews with several teachers, program coordinators, school administrators, and representatives of the school's external partner. Researchers collected samples of teachers' assignments and student work in mathematics and writing. They also collected documents such as school improvement plans, proposals, and reports related to participation in the CAC, and data on student achievement. Drawing on all this information, each team produced an extensive report on the school according to each support for school improvement that the Chicago Annenberg Research Project uses to describe school development (effective school leadership, teachers' professional community, parent and community involvement, student-centered learning climate, and high quality instruction).[4] From this field data, we were able to rate the extent of program coherence within each school.

We developed a rubric that assessed the extent of coherence according to 13 different indicators listed in Figure 1. These 13 indicators were constructed to capture the three major components of instructional program coherence discussed earlier. Items 1-5 in Figure 1 reflect aspects of a common instructional framework; items 6, 7, and 9 reflect staff working conditions, and items 8 and 10-13 reflect strategic allocation of resources.[5] Each school's field report was rated on each indicator by one of this report's authors and the lead researcher for the school. If the two raters disagreed, they discussed the ratings and evidence from the school until they reached agreement on the rating. All indicators were scored on a 4-point scale from 1 = not at all, to 4 = to a great extent. On average, 93 percent of the initial ratings for a school were either in precise agreement or off by no more than 1 point.

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[1] See Wright and Masters (1982).

[2] Empirical Bayes estimates of average school coherence were computed through hierarchical linear models.

[3] See Van der Linden and Hamilton (1997) and Bryk, Thum, Easton, and Luppescu (1998).

[4] See Smylie, Wenzel, et al. (in press) for further details on the field work design and results from the first three years of school development under the Chicago Annenberg Challenge.

[5] Two criteria in our formal definition of instructional program coherence (teacher hiring and evaluation practices) could not be rated because suitable data were not collected on these matters.

Figure 1

Measuring Instructional Program Coherence from Field Reports: Rubric Indicators and School Ratings

Rubric Indicators	Ackerman	Bishop	Chelsea	Hartford	Knoll	Larkin	Mathews	Sparrow	Templeton	Van Dyke	Wilson
1. Teachers within a grade purposely link their curriculum (including arts, health, library, computers, etc.) to stated learning goals.	4	3	2	3	3	3	3	2	2	2	2
2. Teachers within a grade use common instructional strategies.	4	4	3	2	3	2	2	2	2	2	1
3. Teachers within a grade use common assessments.	4	4	3	3	2	4	2	2	2	2	2
4. Teachers coordinate curriculum and assessments to avoid repetition and to offer students new and more complex aspects of subject matter as they move from grade to grade.	3	4	3	2	2	3	2	2	2	1	1
5. School-sponsored support programs, such as remedial instruction, assemblies, field trips, tutoring, and parent education, are linked to the curriculum, instruction, and assessments of the school program.	3	2	3	2	2	2	2	2	2	2	3
6. Professional development for staff supports the implementation of common curriculum, instructional strategies, and assessments.	4	4	3	3	2	2	2	2	1	2	1
7. Professional development programs are sustained over time.	4	4	4	2	3	2	2	1	1	2	1
8. The school strategically accepts and refuses programs and initiatives in a manner that supports staff focus, program continuity, and ongoing improvement.	4	3	4	1	1	2	2	1	1	2	1
9. School improvement planning and assessment directly address the school's progress in providing a common, coordinated, and sustained school program.	4	3	4	3	3	3	3	2	1	2	2
10. Curriculum remains reasonably stable over time and thus provides teachers sustained opportunities to learn how to teach it well.	4	4	4	3	2	2	2	2	3	2	2
11. Assessments remain reasonably stable over time so that teachers have sustained opportunities to prepare students well for them.	4	4	4	3	2	2	2	2	3	2	2
12. Teaching assignments remain stable enough over time that teachers have sustained opportunities to learn how to teach a particular group of students.	3	2	3	2	3	2	4	4	4	3	3
13. Key program leaders and positions remain stable over time so initiatives can be supported and developed.	4	4	4	2	3	2	2	4	3	2	2
Score Totals	**49**	**44**	**43**	**31**	**31**	**31**	**30**	**28**	**27**	**26**	**23**

Note: The school names used above are pseudonyms to protect school confidentiality as agreed to in the data collection protocol between the Chicago Annenberg Challenge Research Project and the sample schools.

John Bonz

III. Is Instructional Program Coherence Related to Student Achievement: Survey Results

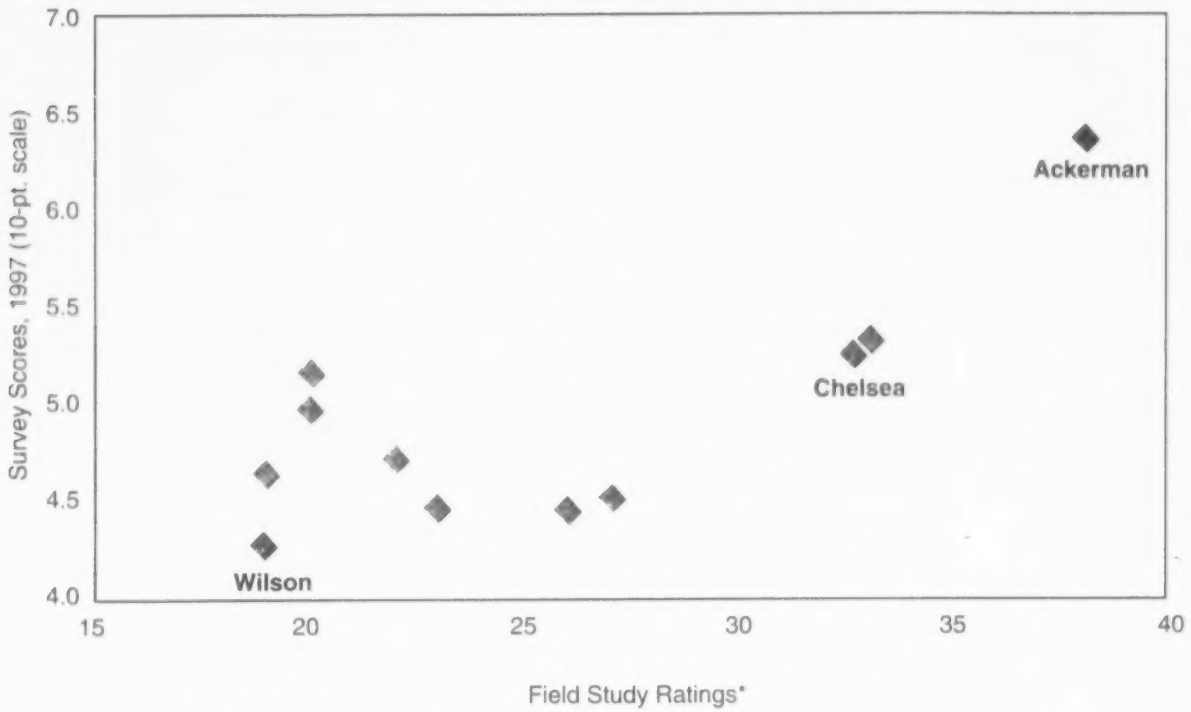
Recent CPS policy initiatives, including high-stakes testing and placing schools on probation, have prompted many Chicago schools to try a variety of approaches in order to raise their students' standardized test scores. In addition, external organizations, including the Chicago Annenberg Challenge, have offered schools a variety of improvement interventions. The abundance of activity focused on reform in Chicago provides an important opportunity to examine the extent to which schools channel these diverse reform efforts into coherent instructional programs, and whether this, in turn, results in improved student achievement. We undertook a combination of statistical analyses and in-depth case studies to investigate these concerns.

In trying to assess the strength of instructional program coherence within schools, it is unreasonable to expect that all elements of a school could be fully coordinated and aligned, or that a school would be so disorganized as to show no coherence at all. Because many factors contribute to instructional program coherence, judgments about school coherence are most useful when made on a continuum from "low" to "high," depending upon how many of these indicators are met and to what degree.[12]

In the statistical analyses presented below, we used teacher survey reports to measure the degree of instructional program coherence in each school. In the field studies discussed in the next section, we relied on coded ratings from field notes. We found in the field sample of 11 schools, a strong correlation of 0.70 between teacher survey reports in 1997 about instructional coherence, and the researchers' ratings of each site, based on the 13-point rubric. The

Figure 2

School Field Study Ratings and Survey Scores for Instructional Program Coherence in 11 Schools



*When schools are rated high (or low, or in the mid-range) on both the x and y axes, this indicates agreement between the measures. The concentration of points in the bottom left corner of Figure 2 (low on both measures) indicates that those schools which showed low ratings on the survey also tended to receive low fieldwork ratings, while the points in the top right of the figure (high on both measures) indicate that those schools which had high fieldwork ratings also tended to have moderate or high survey scores. In order to match the field study indicators as closely as possible to the survey items for the analysis, four field study indicators were not used in the comparison with survey scores. Deletion of these indicators from the total for each school did not change the rank order among the field study schools.

correspondence between survey reports and researchers' ratings of the field sites is shown in Figure 2. This assures us that the survey measures used in our analysis of achievement trends tapped important organizational differences among schools; and that the organizational differences identified in the small sample of field studies are likely to generalize more broadly across Chicago elementary schools.

The central question in our statistical analyses is whether schools with improving instructional coherence actually show improvements in student achievement over time. As discussed above, there are good theoretical arguments about why this should be the case, but only very limited empirical evidence has been assembled previously on this concern.

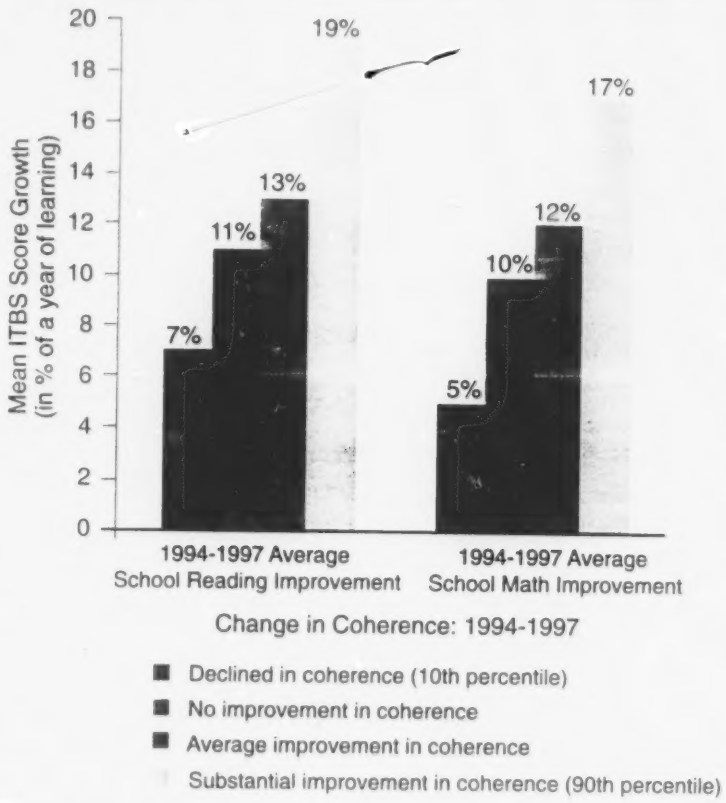
To answer this question, we examined the relationship between teachers' reports about the degree of coherence in their schools, and the achievement of their students on the Iowa Tests of Basic Skills (ITBS). Chicago elementary school teachers were asked to assess the degree of instructional program coherence in 1994, and again in 1997. We used these teacher sur-

vey responses to produce measures of program coherence in the schools in each survey year. We then used students' scores in reading and mathematics on the Iowa Tests of Basic Skills from 1993-1997 to measure each school's achievement trend.

More specifically, we employed a hierarchical linear model analysis to assess the relationship between changing levels of instructional program coherence and improving elementary school achievement trends. We controlled for both the initial school achievement level and the initial level of instructional coherence. In this way, we can assess, regardless of where schools started, whether efforts to improve the coherence of instruction culminated in improvements in student learning. These analyses also took into account other significant characteristics of the schools that were associated with both coherence and student achievement trends. This allowed us to assess the effects of coherence net of these other factors including size of school enrollment, the racial/ethnic composition of the school, students' socioeconomic status, and the schools' student mobility rate. See the Appendix for further details.

As shown in Figure 3, we found a strong, positive relationship between improving coherence and better student achievement. Schools that improved in instructional program coherence between 1994 and 1997 demonstrated improved student test scores over the same period of time. On average, Chicago public schools generally showed gains in test scores in both reading and mathematics of about 12% from 1993 to 1997. Schools that declined in coherence lost ground, however, relative to other CPS elementary schools over this period. In contrast, schools that showed substantial improvement in coherence achieved average ITBS scores that were almost one-fifth of a year of learning higher in 1997 than they were in 1994. A test score gain of one-fifth of a year is equivalent to about two additional months of schooling per year, which is not trivial.[13]

Growth in Average School ITBS Scores by Change in Coherence from 1994 to 1997
(Controlling for School Demographics and Coherence in 1994)



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IV. Organizing Instructional Program Coherence in Schools: Field Study Results

The field-based accounts reported in this section come from studies in 11 Chicago public elementary schools participating in the Chicago Annenberg Challenge. Researchers visited these schools in 1997 and, based on interviews, observations, and school documents, wrote extensive reports describing the activities of teachers, administrators, and students. Each school was rated on the strength of instructional program coherence according to 13 different indicators.

The field reports indicated substantial variation in instructional program coherence, as shown in Figure 1. While three schools rated fairly close to the highest possible score of 52, eight of the 11 schools were rated 33 or below. These data suggest that strong instructional coherence is not common among Chicago elementary schools.

As noted earlier, we found considerable correspondence between teacher survey reports and field research accounts (see Figure 2). Both measures identify marked differences among schools in their overall level of coherence. Both identified the same schools as having the highest and lowest levels of coherence. The measures were less consistent for two schools in the middle range, but these disparities were modest. The level of agreement found here invited more detailed analysis of the narrative reports to learn more about what instructional program coherence looked like in schools, and why some schools had achieved higher levels than others.

We now describe three schools that illustrate different levels of instructional program coherence, noting how relatively strong coherence may be achieved in different ways and may carry different implications for the quality of schooling. The first two schools described below ranked relatively high on both the survey and case study measures of coherence, and illustrate how instructional program coherence can support different approaches to school improvement. The third school ranked very low on both ratings; its situation shows how weak coherence can impair sustained efforts at school improvement.

Chelsea: Strong Coherence Through a Literacy Program and Collaborative Faculty Reflection on Student Outcomes

One of the high scoring schools was Chelsea, a sprawling elementary school serving more than 1500 students from mostly working poor families. High levels of coherence in such a large and diverse organization suggested a deliberate campaign to focus school improvement efforts, and the field data showed this to be the case.

One initial sign of strong coherence at Chelsea was fairly consistent staff reference to a set of goals around which school leadership and its external partner organized long-term improvement efforts. These shared goals included: to develop an effective literacy program across all grades, to strengthen leadership across the school community, to create a social services team to assist troubled students and to involve parents, and to build the school's capacity for strategic planning and program evaluation. Chelsea's principal also had clear goals that did not involve the partner, such as the development of schools-within-schools to promote a learning community, and greater training and use of instructional technology. Compared to most of the visited schools, where teachers typically reported many different initiatives, Chelsea staff shared a more coherent vision for change.

Chelsea's principal explained this focus by frequently saying, "*We keep it simple.*" Yet, the school had undertaken several complex improvement efforts. The highest priority was a literacy initiative. For four years, the school had worked with its external partner to implement a framework for literacy instruction and student assessment based on the Reading Recovery program. Chelsea's principal made it clear that she wanted all teachers, regardless of grade, subject, or bilingual assignment, to work with a specific literacy framework and to collaborate with peers in using it. The goal was to have Chelsea teachers trained to work together to develop not only common learning goals, but also common teaching practices, common learning tasks and activities, and common measures and standards of assessment.

In the area of writing, for example, the idea was for teachers to do more than simply agree to "teach narrative and expository writing." Instead, they were to reach agreement on matters often left to individual teacher discretion: which materials to use, which instructional strategies to use to develop distinct forms of writing, how to formulate grade level expectations, and how to recognize different stages of student accomplishment. While the principal could not force teachers to do all this, she acted to persuade reluctant teachers. For example, when she and others at Chelsea wanted to promote higher order thinking, they worked to develop a bank of tested and refined lessons directly linked to the reading program teachers were using. When enthusiastic primary grade teachers piloted these lessons, the principal made sure to visit their classrooms to show her support. When other teachers were reluctant, she coaxed them to try. In short, teachers at Chelsea were supported and prodded to work beyond their own classrooms in order to implement a more systemic conception of instruction and literacy development.

The school allocated impressive resources to pursue the literacy initiative. At the time of the research visit, 60 percent of Chelsea teachers had taken a six-month, intensive training course in the literacy framework. It was expected that the final group of upper-grade teachers would be trained in the following year. Three full-time, school-based literacy coordinators were hired to assist teachers on a daily basis to implement the framework. They offered after-school workshops, searched for materials, and outfitted the learning resource center that supported the program. They visited classrooms regularly to observe, demonstrate, coach, and co-teach. The coordinators were acutely aware of what individual teachers and students had and had not accomplished, and thus could knowledgeably confer with colleagues from year to year on what expectations to set for themselves and their students. An external partner staff person explained, "It's an 'in-your-face' approach. The presence of the coordinators in the school is a daily reminder of the work that must be done to improve the teaching of literacy."[14] A literacy coordinator added, "We leave nothing to chance. If a teacher needs books, we

supply books; if she needs poster board, we supply that . . . so there's no excuses for not trying."[15] The sizeable and sustained investment in the literacy coordinators, combined with a stable administration and program focus, assisted Chelsea in adopting and refining new literacy practices and standards.

Strong instructional coherence at Chelsea was promoted through its sustained participation in leadership development programs organized by its external partner. Chelsea's principal conferred on a regular basis with a leadership mentor in the partner organization. This relationship, combined with network meetings of principals working towards similar goals, supported her in pressing forward with the reforms and standards she valued. At the same time, a leadership team of administrators, literacy coordinators, teacher representatives, and community representatives was formed and trained by the partner to function as the governing body for the school. This team learned how to facilitate communication through the school and how to serve as the central decision making body for school improvement planning. Having all undergone the same intensive literacy training, and accepting leadership responsibilities for priority goals, members of the team were more likely to see themselves as holding common commitments rather than as guardians of diverse and disconnected programs.

Perhaps the most distinguishing feature at Chelsea was the emphasis school leaders and the external partner gave to open and continuous reflection and evaluation of the school's instructional outcomes. The partner believed strongly that if the school was to make substantive gains in student performance, the staff had to look closely at its own practices to see where it was succeeding and where it was stuck. They recognized that teachers who were asked to relinquish some forms of individual autonomy would need evidence that their endeavors brought about desired results. To build concrete evidence on the outcomes of improvement efforts, the partner and school staff began to develop literacy assessments aligned to the framework, and to analyze carefully student outcomes in small groups. Such scrutiny of individual teacher outcomes pushed against norms of classroom privacy and was a difficult process to initiate. Noted the principal, "[This] work is kind of amazing. You don't see it often . . . the ability of teachers to assess where they are at. . . . To me, it is more important than the ITBS. That's where [in these kinds of discussions] they're improving instruction for kids."[16] Introducing this form of review and reflection was quite difficult and tenuous, but the partner argued it was necessary to sustain, and to reward, teacher commitment to the literacy framework and the collaborative work it required.

While Chelsea welcomed programs that it believed would enrich students' experiences, it became more careful to do so in ways that did not fragment teachers' time and focus, or threaten the school's improvement momentum.

Chelsea also took important steps to improve strategic planning. The administration and lead team weighed the value of potential programs, grants, and opportunities in relation to their ability to support directly the four goals. To enhance parent and community involvement, the social services team sifted through numerous agencies, needs, and possibilities to select and cultivate only three initiatives. While Chelsea welcomed programs that it believed would enrich students' experiences, it became more careful to do so in ways that did not fragment teachers' time and focus, or threaten the school's improvement momentum.

Despite these positive moves, Chelsea continued to struggle with many problems and challenges. Progress toward the priority goals was more difficult than anyone anticipated, and some teachers participated with only minimal commitment. The highly coherent vision of language arts instruction did not carry over into math, social studies, or science, though

a move to begin math development was underway. Reading achievement increased, as measured by internal literacy assessments and the ITBS (and math achievement increased as well), but student literacy was still far weaker than the staff thought it should be. Nevertheless, among the schools visited, Chelsea stood out as a school that had succeeded in directing resources and collective effort toward a set of core, schoolwide goals and standards of instructional practice. Chelsea's more coherent program came to offer students more effective opportunities to learn, because many key learning experiences and supports were rooted in a system of well-developed knowledge and practice that was steadily built upon. Thus, there was reason to see Chelsea, not simply as a school that had made gains, but as one with potential for continued growth and development.

Ackerman: Strong Coherence Through Coordinated Adoption of Direct Instruction

Among the 11 case study sites, Ackerman school had the highest survey scores and field study ratings. The school served 900 students, nearly all of them from extremely poor homes. Due to chronically low student achievement, the school had been on academic probation for several years. Recently the school showed improvement, thanks to a strong, energetic principal who initiated building repairs, introduced more professional work norms and mounted a concerted effort to raise student achievement. At the time of our visit, teacher enthusiasm and commitment to the school were high. Remarks such as "This is a democratic school" and "Differing opinions are very respected. . . . If there is a minority opinion, the principal will ask us to figure out ways to have the idea [addressed]," were typical.[17]

One major decision made by the staff was to adopt a Direct Instruction program modeled on Houston, Texas's DI Program (formerly known as DISTAR), which some staff had traveled to observe.[18] After much discussion, the staff decided to use the program for students in grades one through six, but not in grades seven and eight. Explained one staff member, "We had a problem with our test scores. We came together as a group to decide on the best method to get us out of the hole we were in. Direct Instruction has worked and we are still working with it."[19] The program provided scripted lessons and matching assessments for daily instruction in mathematics and reading. To supplement the Direct Instruction program, Ackerman also funded training and development of one teacher in each grade to serve as a grade-level literacy leader. These teachers assisted peers in building classroom libraries, from which students would regularly select, read, and write about works of fiction and nonfiction. The fully articulated instruction and assessment scheme provided by the Direct Instruction program, along with schoolwide implementation of the literacy/library supplement, were leading reasons for Ackerman's high rating on instructional program coherence.

Among the schools visited, Ackerman was also unique in how it coordinated instruction across grade levels. Said one teacher, "We don't just meet if we are in [the same grade]; we meet with three different groups. For example, we meet with the fourth grade teachers and bring some fifth-grade teachers in [to discuss] what you expect the children to do."[20] Ackerman teachers regularly worked in both within-grade and across-grade teams to coordinate their efforts and to address issues of concern, often meeting twice weekly to do so. In many schools, a reluctance among teachers to be critical of their colleagues stifles collaboration of this sort. That open professional conversations were becoming customary at Ackerman indicated a strong climate of professional trust and community—important conditions that supported teachers in coordinating curriculum, instruction, and assessment.

As at Chelsea, Ackerman's high coherence rating reflected focused and strategic use of school resources. Ackerman invested in ongoing, whole school staff development specifically designed to assist teachers in implementing Direct Instruction and in developing assignments based on the literacy libraries. All of the teachers we observed were working from the Direct Instruction or classroom library materials. Most had been working with the materials for several years, developing their knowledge and skill in using them with the grade they taught. Administrators and teachers

consistently expressed the view that "most of what we do in terms of budgeting and processes is going towards the end goal of raising test scores."[21] The external partner working with Ackerman supported increased opportunities for teachers to work together to review and improve the instructional program, while also building a network of after-school supports for students.

That open professional conversations were becoming customary at Ackerman indicated a strong climate of professional trust and community—important conditions that supported teachers in coordinating curriculum, instruction, and assessment.

On balance, not every school would agree with Ackerman's decisions to adopt Direct Instruction and to focus its program so much on improved test scores. Nevertheless, Ackerman became a school with explicit and focused goals, clearly understood priorities, and a shared instructional framework that specified strategies for teaching and assessment. Staff considered this common approach a significant improvement over past practices and believed that their intense focus on basics assisted them in improving math achievement across the school, and reading achievement in the middle and upper grades.

Wilson: Weak Coherence as Teachers Work Independently on Different Instructional Strategies

Wilson School serves almost 1000 students living in a tree-lined neighborhood of families from many economic levels. The school has a reputation as the "flagship school" in the local community. But demographic changes in the neighborhood, combined with this reputation, has recently led to a serious problem of overcrowding.

Each person interviewed stated that Wilson staff shared a common primary goal: to improve their students' standardized test scores. Staff said the school had recently become much more instructionally focused. But a clear and uniform focus on test achievement appeared to be about the only shared understanding operating throughout the staff. Wilson had many resources, programs and supports that could conceivably help it reach this goal, but the resources were not organized around a coherent strategy.

Classroom observations and follow-up interviews with teachers rendered little evidence of a coherent instructional framework beyond emphasizing curriculum items similar to those on the standardized tests. It was up to each teacher to decide what parts of such a "curriculum" to teach and how to teach them. This statement by one teacher was expressed in similar terms by most members of the staff: "Teachers have the same frustrations, but they deal with them independently in their classes within the context of the [test] goal."[22] Teachers both within and across grade levels used very different text series and materials. Some classrooms did not have full sets of any one series and many texts were extremely old and abused. Teachers reported that the school did not have sufficient funds for new materials. Given the school's pool of discretionary funds, however, this complaint was not very credible. A curriculum committee had been discussing new purchases, but other teachers said they were unsure what purchases were being considered. In general, teachers were left to work with their students without much direction from school leaders or their colleagues.

Though many teachers seemed to care deeply about their students' development and achievement, teachers did not report any common efforts to provide students with a more carefully planned instructional program. The understanding that every teacher was preparing students for the ITBS seemed to be accepted as a sufficient framework for effective practice. While some teachers at the school may have been providing

their students with excellent instruction, researchers found little evidence of collaborative work to improve curriculum, instructional strategies, or assessments. As summarized by one teacher, "People work individually at this school. I have tried to discuss joint lesson planning, but nobody has ever tried to jump on this idea. They are pretty much used to doing it by themselves. I'd rather do it together, but everyone is on their own."[23]

All of the teachers interviewed reported that they were involved in staff development activities, and the school administration expressed confidence that staff development was helping to improve teaching. The assistant principal said, "We know that staff development on new methods of teaching language arts and mathematics will help [our teachers] improve because we know we need new ways of motivating our students to keep them interested in learning."[24] But no one identified what these new methods were. One teacher replied, "We all have different methodologies. There are a lot of new teachers here, so I don't really know what they are trying to do."[25] When asked about recent staff development activities, teachers reported a diverse mix of presentations, workshops, and continuing education programs they attended individually. Weekly and monthly teacher meetings were mentioned as occasions for professional development, but when asked what occurred during these meetings, most teachers described them as periods for announcements, updates, and ad-hoc conversations. Explained a third-grade teacher, "We do have primary level meetings, one or two times a month, but the meetings are more announcements . . . than discussion of instructional issues."[26]

Wilson had a general mission statement, but any more focused identity for the school was subject to disagreement. Sometimes the phrase "language academy" was used in the school's title, but sometimes not. Researchers were told by some that all students study Spanish, but a flyer about the school stated that students were "exposed to Japanese, French, and Swahili." Some teachers reported that they thought the school was moving towards an emphasis on technology; others felt that the school's programs on cultural pride and identity were the defining feature. A group of teachers wanted to break away from the main organization and create a small school inside the building. They were supported in doing so until the last minute, when the administration cancelled the effort and reassigned some of the teachers.

Like all the schools in the fieldwork sample, the school is a member of a school improvement network funded by the Annenberg Challenge. But only one teacher, newly hired to the school, was involved, and this was largely because she was told it was part of her assignment. The majority of teachers interviewed did not know that their school was a member of the network, or thought that an after-school program sponsored by a different partner was actually the Annenberg initiative. While staff repeatedly mentioned the importance of common goals, it was hard to see how an apparently loose confederation of programs and emphases could accomplish this aim.

On balance, Wilson school was not a chaotic or unprofessional organization. Researchers found the school to be very friendly and orderly. Teachers described the school as a "respectful" and "helpful" organization where they felt able to raise questions, doubts, and concerns. Many teachers were clearly dedicated, talented, and hard-working. The principal had recently been selected to serve as a mentor in the district's leadership development academy. The school's external partner had worked to build strong ties among the school, its parents, and the larger community, which pleased many teachers. Said one, "[They are] teaching the kids about culture and community, that they should respect their elders, that there are some great people living right here, that their community has lots of different areas and lots of opportunities, right here."[27] We can imagine others visiting Wilson and drawing complimentary portraits of teacher autonomy, cordiality, and positive school-community relations. But instructional program coherence at the school was weak, and because of this the prospects for the improvements that everyone at the school hoped for remained dim.

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How Do Schools Achieve Stronger Instructional Program Coherence?

In general, the 11 field study schools varied substantially in instructional program coherence. Analysis of the school reports showed that the higher scoring schools achieved stronger coherence because principals and other key actors directed resources toward a clearly articulated instructional program framework. We now consider the nature of this leadership and some key strategies used to support stronger instructional program coherence in these 11 field sites. The pseudonyms we use when we point to particular schools are keyed to our ratings of coherence shown in Figure 1.

School Leadership

Stronger instructional program coherence was rooted in a principal's decision to adopt or develop a schoolwide instructional program framework and to make this a priority. We observed both highly democratic and more autocratic approaches that advanced this aim. For example, in some high scoring schools (Chelsea, Ackerman), principals promoted coherence by leading the staff in collectively adapting and refining an instructional framework. In others (Bishop, and to a lesser extent Larkin), principals directed teachers to use pre-existing frameworks, and required staff development aimed toward uniform implementation. Regardless of how they proceeded, all of these principals shared the view that a common approach to instruction would assist student achievement. Noted Chelsea's principal, "You will not have an effect if you are just working with five or six teachers; you have to have 20 teachers to make a difference."[28]

In contrast, principals of the less coherent schools did not seek to organize their instructional programs around common frameworks, and their schools were characterized by norms of individual teacher autonomy over curriculum assessment, and instructional methods. In Wilson and Sparrow, for instance, principals, seeking to support teacher motivation and innovation, were deliberately reluctant to constrain teachers' approaches to instruction. Explained Sparrow's principal, "I don't say 'No' to many people or to many things. . . . We try to bring in new ideas and new methods, new strategies."[29] In other low scoring schools, teacher autonomy reflected diffuse and uncoordinated instructional leadership (Mathews, Templeton), or a clear lack of leadership (VanDyke). Many staff members in these schools seemed wary of using any single instructional framework, feeling that since "some kids thrive on one method and some on another method," it was best to allow teachers as much choice and discretion as possible.[30]

We did find cases in which the principal's imposition of a common instructional framework had unfortunate consequences. Consider, for example, Bishop Elementary School, which scored high on both survey and field-based measures of instructional program coherence. Bishop had much in common with Ackerman; it enrolled around 630 students from a very impoverished community and had been on academic probation since the sanction was first imple-

mented by CPS. Like Ackerman, Bishop had adopted a Direct Instruction program as a way to focus instruction throughout the school. Scripted, Direct Instruction was used in all eight grades and for all academic subjects, and staff development concentrated on assisting teachers in implementing the program. Many at the school saw student achievement gains from 1994 to 1997 as a clear product of this approach.

Bishop was, nonetheless, a troubled organization. A large number of teachers opposed exclusive use of the Direct Instruction method. As one teacher observed, "I think Direct Instruction is a good method for lower grades, but I think that we have got to realize that students need more than basic skills; they have to develop critical thinking skills. They have to be able to think beyond the basics."[31] Some teachers felt no ownership of the program at all. Said one, "Direct Instruction wasn't something the teachers selected. It was selected for us."[32]

Researchers reported teachers' perceptions that the principal had become increasingly autocratic and distant, with a waning commitment to school improvement. Explained one frustrated teacher, "I don't really think that [my opinion] makes a difference one way or another. . . . The goals are made by our administration, and because of the [probation] status of our school right now, we have very little input."[33] Several teachers reported declining motivation to work together since they perceived little opportunity to voice or implement their ideas. Other teachers were demoralized and looking for work in other schools. Researchers also noted that the school's learning climate was marked by high levels of stress, sarcasm, and student punishment.

Bishop's experience illustrates a very important point. Instructional program coherence achieved by administrative fiat is of limited value if it suppresses the development of equally essential supports for learning, such as teachers' professional community and shared ownership of a high quality instructional program. Imposing coherence from the top may boost student test scores in the short term, but it may also constrain long-term prospects for school development.[34]

Principal actions to cultivate or command a common instructional framework are central to stronger coherence, but it is important to note that other key actors can provide leadership as well. As participants in the Chicago Annenberg Challenge, each of the fieldwork schools was linked to an external partner responsible for helping the school to improve. Chelsea, which adopted the partner's program as its central strategy for school improvement, showed that an external partner can significantly assist a school in advancing stronger instructional program coherence. The principal reflected that, "The [partner's] support is tremendous. You actually get reading experts and best practices. I was going to piecemeal that. Here it is systemic."[35] Enhancing the school's instructional coherence, however, was not a central objective for most of the partners in the fieldwork sample. More commonly, partners guided the development of particular programs or initiatives. Larkin's partner assisted the development of a parent involvement program, for example. Further, many of the low scoring schools (Wilson, Knoll, and Sparrow) had several external partners who never coordinated their activities within the school, thus impeding greater coherence.[36]

Organizing Resources

It is important to note that the more coherent field study schools did not have significantly greater fiscal resources, or significantly more staff members per student. These schools, however, did use a core set of strategies to harness existing resources and staff energy toward a common instructional framework and a core set of school improvement goals.

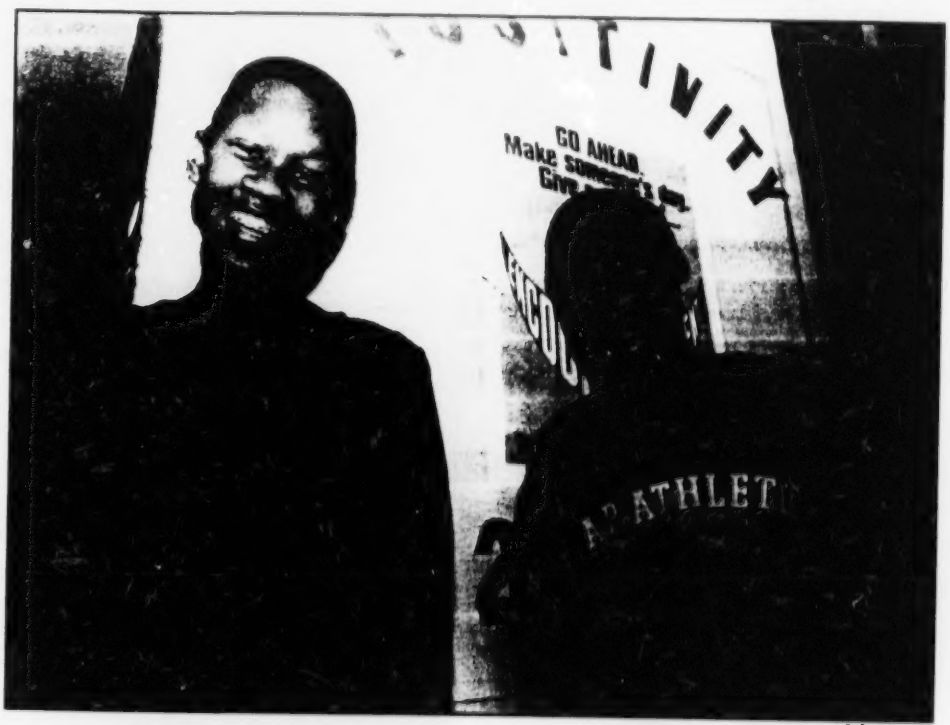
Investing in schoolwide use. One feature which distinguished the high and low coherence schools was significant investment in instructional materials and programs, including staff development, that were grounded in a particular conception of instruction and, importantly, implemented on a schoolwide basis. Two of the high scoring schools invested in Direct Instruction programs that provided a previously published comprehensive framework of instruction across subjects and grades, as well as all necessary materials for student lessons and staff training. In contrast, Chelsea's work with its partner to develop a

comprehensive literacy framework was more complex. Because it offered more flexibility in daily instruction across classes, it called for a greater range of technical resources, including a broader array of materials and instructional strategies, as well as more intensive training for staff. Chelsea's long-term investment in a range of high quality technical resources was unique among the sample of visited schools.

To foster progress and staff commitment, leaders in the higher scoring schools also funded special program coordinators who directly assisted staff in implementing instructional frameworks. Again, the strongest example of this was at Chelsea, but several other schools (Ackerman, Bishop, Larkin, and Mathews) also funded facilitators. Since highly-trained coordinators are often recruited away from the schools that train them, schools' investments in such positions can be risky. We noted, for example, that low scoring VanDyke had, in fact, invested heavily to train and develop literacy coordinators who left the school soon after they completed the training.

The mid and lower scoring schools did not use technically strong whole school reform models and did not employ well-trained school coordinators to offer continuing on-site staff development. Instead, these schools tended to use more diffuse assistance and development strategies. For example, Larkin school had made some gain in coherence by instituting grade-coordinated curriculum and assessment materials. But it also purchased multiple reading programs and workshops that each involved small numbers of teachers. In other low scoring schools (Sparrow, Templeton, and Wilson), principals spoke of making assistance "available" to teachers and of inviting teachers to "ask for what they need" as small groups and individuals. Many teachers in these schools participated extensively in school improvement activities, but their efforts were not focused and aligned. In several cases, teachers reported that they were often unaware of the improvement activities of fellow staff. Low scoring schools, with more diverse programs and investments, also appeared to have greater problems following through on resources in which they had invested. For example, several had purchased curriculum materials and computer technology they believed could help students perform better on the ITBS. But the materials were often purchased and delivered without training, or discussion of how to maximize or assess their benefits, and without a scheme for ensuring they were used in the manner intended. Only some teachers reported actually using the materials.

Staff collaboration around a common framework. Tighter coordination of instruction entails more than



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just a commitment to a schoolwide framework grounded in a strong technical base. It requires extensive ongoing communication among teachers, and working together and giving mutual assistance to improve instruction according to the framework. School leaders in the higher scoring schools promoted such collaboration by establishing common planning periods for grade-level and across-grade planning groups; by forming schools-within-schools to facilitate more extensive collaborative relationships among smaller clusters of teachers; and by establishing representative teams and committees to deal with school governance issues.

Higher scoring schools tended to provide these structures for collaboration, but alone these structures are not sufficient to break down traditional norms of teacher autonomy. In addition, principals, school coordinators, other school leaders and external partners actively worked over a sustained period of time to coax teachers into collaborative activity around core instructional goals and strategies. In lower scoring schools, planning periods were not available or were seldom used for group work around a common instructional framework. The principal and staff at one low scoring school had recently abandoned common planning periods since few of the teachers used them for collaborative work and they complicated the schedule.

Coordinating community resources. Principals also faced the challenge of how to select and coordinate social resources such as parent volunteers and programs sponsored by community agencies. Such programs often seemed responsive to special student needs and/or provided additional funds for staff. Comments made by administrators and teachers in most of the visited schools suggested, however, a need to "get a better handle" on these resources. Said one principal, "I don't want to be out there taking my time to get resources and then have . . . teachers not taking advantage."[37]

Most schools tried to encourage parent involvement programs that emphasize reading and homework assistance. Because assistance of this sort was clearly connected to undisputed literacy goals, it generally posed no threat to instructional program coherence. On the other hand, the impact on coherence of many community-sponsored programs was less clear (for example, adult-student mentoring, business partnerships, environmental projects, and museum and arts outings). Such programs, typically designed as short-term, stand-alone initiatives for adoption by any school, seem less likely to fortify a school's particular instructional framework or even to imply that instructional program coherence is important. Several principals

in the mid and low scoring schools rarely rejected these programs, because they saw them as valuable opportunities to enlarge students' horizons and boost self-esteem. Whether or not such programs weaken instructional program coherence probably depends upon how they are administered and managed. But if, as was observed in several cases, they disrupt teachers' and students' concentration on the main instructional framework, they pose a threat to coherence. Principals in the higher scoring schools seemed more ready to minimize such threats, and more aware that "You can, in fact have too many resources."[38]

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V. Interpretive Summary

Instructional program coherence plays an important role in school improvement. This conclusion is consistent with a broad body of prior research on student learning and engagement, teacher effectiveness, organizational effectiveness, and effective schools. Our quantitative analysis using teachers' survey responses shows positive connections in a large number of schools between strengthening instructional program coherence and improving academic achievement in both reading and mathematics on the Iowa Tests of Basic Skills. Correspondence between teachers' survey responses and field ratings by independent observers who read individual reports of schools also indicates that the strength of program coherence in individual schools can be reliably measured.

Schools in our field sample that ranked high on instructional program coherence had stronger principal leadership than lower ranking schools. With the help of external partners, these principals instituted common instructional frameworks and supported them by investing in schoolwide technical resources, such as high quality curriculum and assessment materials. They promoted extensive collaboration among staff, and focused the use of community-based programs and resources on one or just a few core schoolwide improvement goals. Importantly, they sustained these efforts over a significant period of time. In contrast, leaders in lower ranking schools allowed teachers more individual autonomy and discretion to select their own curriculum materials and their own strategies for instruction and assessment. New resources and collaborative efforts in these schools were often significant, but were spread across multiple programs and initiatives, each involving a limited group of faculty.

Cautions in the Pursuit of Strong Instructional Program Coherence

In recommending that educators work to establish greater instructional program coherence, we also note important qualifications and limitations. Instructional program coherence must be focused on achieving worthwhile educational goals. A school could, for example, become highly coherent by instituting instructional frameworks that are narrowly-focused and that rely on repetitive lessons that prepare students for only the most basic academic tasks. Bringing greater coherence to instructional programs does not mean that it is acceptable to deny students opportunities for individual expression, higher order thinking, or in-depth understanding of a variety of subject areas.[39] The value of strong coherence ultimately depends on the educational legitimacy of the aims for students embedded in the school's program of instruction.

Second, strong instructional program coherence can be implemented in ways that foster an undesirable professional environment for staff. A program might insist on instruction that is so regimented that teachers have no opportunity to use professional expertise or to raise legitimate questions about the efficacy of selected methods or programs. A school might require practices so standardized that teachers are prevented from responding to students' unique learning needs, interests, and skill levels. Similarly, teachers' professional development opportunities might be so uniform as to prevent individuals from learning the skills uniquely suited to their teaching situations and prior backgrounds. We observed a number of these problems at Bishop Elementary School when the principal imposed a tight framework without cultivating staff ownership of it.

Moreover, some schools may indeed require differentiated programs to serve students with very diverse and special needs. Program stability is generally desirable because it allows for continuing improvement. The general benefits of stability, however, should not be invoked to sustain ineffective programs. The quest for program coherence must respond to appropriate forms of differentiation for students and staff, and be receptive to new or altered programming when clearly necessary.

These points underscore the need to put strong program coherence in perspective and to see it, not as the overriding task of school improvement, but as a cross-cutting emphasis that helps to coordinate a broad set of supports for improved schools. Efforts to strengthen instructional coherence are likely to be most effective when they are embedded within systemic strategies to build effective school leadership, teachers' professional community, parent and community involvement, and high quality instruction.

Why It Is Difficult to Achieve Strong Instructional Program Coherence

Both our field study work and other studies of school improvement, suggest several explanations for the relatively weak instructional program coherence we found in many schools. These explanations highlight the significance of factors operating both within the school and beyond.[40]

Factors Within Schools. The lack of coherence found in many schools reflects demands for multiple diverse learning outcomes that we ask of our schools (e.g. good behavior, basic skills, advanced conceptual understanding, and building self-esteem). Moreover, student diversity (gifted-talented, at-risk, English as a second language, special education) is usually assumed to require distinct program interventions for each group or problem. This differentiation is reinforced by staff specialization and by categorical funding aimed at special groups or problems. Taken together, the press toward separate programs for different learning goals and different students makes it difficult for teachers to work from a common instructional framework.

Convincing staff to accept a common instructional framework is seen as an overwhelming task, because it requires ongoing agreement, cooperation, and training on the part of both old and new staff. Incremental improvement involving small segments of the staff who work towards short-term goals seems more administratively manageable and less conflictual than

trying to achieve long-term, schoolwide instructional coherence.

Finally, uncertainty about how best to teach and assess student learning effectively tends to encourage a trial and error approach, rather than a common, coordinated approach to instruction. In comparison to other professions where research has produced highly reliable methods of diagnosis and intervention, such as medicine or engineering, educators face substantial uncertainty about how to proceed. Under such circumstances, it can seem reasonable to give each teacher considerable latitude in deciding how to teach. While there are merits to this perspective, it is also clear that achieving coherence within a school around some framework does matter. There may not be one best framework for organizing instruction in all schools; but the presence of a school-specific framework may nonetheless be necessary to enhance student learning.

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Factors Beyond Schools. Ideally, strong school leadership, aware of the need for focus and sustained development, would minimize the influence of the factors above and steer a school toward greater instructional coherence. But tendencies toward incoherence are reinforced by increasing numbers of independent providers of school assistance, such as reform project leaders, professional development facilitators, technology consultants, and instructional material vendors. Incoherence is also aggravated by unaligned district and state policies and by rapid changes among them.

Independent Providers. Independent providers typically establish their impact and legitimacy by disseminating discrete identifiable programs to many schools, not by helping individual schools develop focused, coherent missions. Separate foundations, universities, or other providers usually have an interest in a particular program or topic, such as early childhood development, literacy, classroom management, or science education. In our visits to schools, for example, we observed instances in which facilitators from different organizations worked extensively with school staff, but never talked or worked with one another to help schools focus and integrate their distinct contributions. In some schools, the goals of different external partners actually conflicted.

Another obstacle is the nature of the education publishing industry. Education publishers tend to be rewarded mainly for producing materials (texts, software) for separate subjects and distinct instructional approaches, rather than for comprehensive series that integrate into a common framework high quality materials from different sources, for different subjects and grades. Schools have to shop strategically across multiple vendors to try to patch together instructional programs that include some common elements.[41]

Finally, independent providers and publishers must recruit schools to join their efforts or to purchase their products and services. Such external providers often have minimal political or economic power to move schools in significant ways, because, as vendors in a market, they must in essence persuade the schools to let them in. In order to gain the access and the trust needed to work with a school, a school assistance organization or publisher must, in large measure, accept the school's priorities, rather than insist that the school work toward stronger instructional program coherence.

Districts and States. Much research finds that program coherence is rare in U.S. public schools due largely to a system of political control that resists tight coordination and that includes frequent changes of leadership at all levels.[42] It may, therefore, be unreasonable to expect many schools to achieve strong instructional program coherence without changes in the broader policy context. Compared to independent providers of reform strategies and professional development, districts and states, with their political and legal authority over education, conceivably have more clout to strengthen school instructional program coherence. But there are several reasons why governmental authority is typically not exercised to achieve stronger coherence.

The actual power of districts and states to control school affairs is contested, while debate persists on the authority that parents, teachers, schools, districts, and states ought to have to prescribe education programs. Schools may choose to work with a variety of external partners, but neither district nor state policy requires that partners coordinate their efforts within schools. And when districts and states themselves offer professional development, it is often on a voluntary basis, which puts them in a position similar to independent providers. Districts routinely offer a variety of professional development options from which individual teachers can choose, but rarely with a requirement or incentive for entire school staffs to pursue training together. On the other hand, when districts do mandate professional development, they tend to neglect their own impact on instructional program coherence within schools. Such mandates are seldom designed to help school faculties address unique school needs through a process that generates staff understanding of, and commitment to, a common instructional framework.

One area in which districts and states have recently asserted their authority is in the promulgation of explicit standards for curriculum and/or assessment. Yet, the standards often comprise voluminous lists of discrete skills and items of knowledge that fail to communicate a common framework for instruction. Professional development aimed toward meeting dozens of different standards for different subjects at different grade levels offers no common mission for a school, except that each teacher teach well the list of specified items for each subject and grade level. Grade level teams might work together to decide how to teach specific items, but the students' learning experiences are likely to be fragmented and episodic, and the teachers' work is not likely to be focused on a common instructional framework that emphasizes connections between subjects or grade levels.

These observations about factors beyond schools that weaken instructional program coherence are consistent with historical and sociological analyses of how the external environment influences schools. Research has shown, for example, that since the 1960s, schooling in the United States has at once become more centralized, more federalized, and more fragmented. Federal and state governments asserting greater authority have increased centralization. But at the same time, local communities have simultaneously increased their authority through school-site management. The lack of policy coordination between levels of the school system as well as levels of government (for example, courts, legislative and executive bodies at the state level) exacerbates fragmentation. As a result, schools, in responding to their external policy contexts, have become far more complex organizations with increased funds and personnel dedicated to management and compliance.[43] Given the extent to which administrative resources must concentrate on managing complex organizations and contexts, it is not surprising that instructional program coherence suffers as school principals become preoccupied with a multitude of external demands.[44]

Implications for Education Leaders

The most straightforward implication of these findings is that leaders in schools, in school improvement organizations, and in district, state, and federal agencies should give more deliberate attention to strengthening instructional program coherence within schools.

The following activities could be helpful.

- School principals should focus their improvement

plans, professional development, and acquisition of instructional materials on a few core educational goals pursued through a common instructional framework. Schedules and teaching assignments could provide teachers with common planning time and stable teaching assignments to build skills in implementing the framework. Teacher hiring and evaluation could emphasize skillful use of the framework. Grants and partnerships could be restricted to those that contribute to implementation of the framework.

The most straightforward implication of these findings is that leaders in schools, in school improvement organizations, and in district, state, and federal agencies should give more deliberate attention to strengthening instructional program coherence within schools.

- Foundations and other organizations, such as universities or corporations, that support school improvement or provide direct technical assistance, should emphasize coordination of improvement efforts within schools. A foundation that supplies funds for school improvement could require separate projects in literacy, math, and science to coordinate their efforts within each school. Staff from the different projects, for example, might be required to clarify how the recommended new practices reflect some common approaches to instruction, and how teachers will have sufficient time and other resources to learn, adopt, and refine them in a thoughtful way. Staff development providers could insist on working with school teams rather than a few individual teachers, and could structure the work toward implementation of effective practices across classes and grade levels, rather than only in selected classes.

- District policy should emphasize instructional program coherence as a key dimension in school improvement plans. District-sponsored professional development could be organized around school teams that work on common instructional frameworks. Criteria for hiring and evaluating principals and professional development for leaders, could emphasize instructional program coherence. Administration of categorical aid programs and approval of external partnerships with schools could require tighter coordination among different programs. District curriculum standards and tests could be revised to reflect greater integration of learning outcomes across subjects and grade levels. Finally, an oversight district committee could review district mandates and regulations to consider their fragmenting effects on instructional program coherence within schools.

- Administration of state categorical aid programs could require that funds be used to support, not only schoolwide programs, but also schoolwide programs that are focused and sustained over time and that serve a clear instructional framework. State curriculum standards and tests could be revised to reflect greater integration of learning outcomes across subjects and grade levels. A state oversight committee could review state mandates and regulations to consider whether schools could become more coherent under such mandates. State requirements for licensing of education professionals could require study of the problem of incoherent school improvement efforts, and approaches to building stronger instructional program coherence.

- Leaders in all of the organizations just mentioned should pursue this work with full awareness of the cautions discussed earlier. They should be especially wary of narrow and rigid instructional frameworks that deny students appropriate opportunities to

learn deeply and well. They should take care to avoid administrative imposition of frameworks that poison professional community among teachers in schools, and that prevent individual schools from responding to unique community conditions. More positively, as they strive for greater coherence, they should simultaneously work for the other essential supports for school improvement.

In searching for ways to improve urban schools, some reformers and school leaders have apparently concluded that giving local schools the opportunity to try most anything and everything, without imposing comprehensive solutions from the top, would be a good strategy to find out what works. Perhaps variety, volunteerism, and incrementalism would together produce positive changes that would eventually accumulate across the system.

This study shows, however, that diverse, multiple short-term innovations within a school will not necessarily link up. To improve student achievement, school staff and the external organizations that work with them should aim toward strengthening instructional program coherence. They can do this by helping school leaders and teachers understand sources of incoherence, by supporting them in selecting or constructing common instructional frameworks, and by minimizing barriers to coherence in the external environment. Since the sources of incoherence rest both within and beyond schools, strengthening instructional program coherence requires simultaneous effort from the bottom-up and the top-down. If actions to strengthen instructional program coherence are integrated with actions to develop other key supports for school improvement, schools can build and reinforce the types of staff competence and commitment that will advance student learning.

Appendices

Statistical Analysis

The statistical results presented in this report are based on a 3-level latent variable hierarchical linear model analysis. "Latent variable HLM" is a relatively new development. For complete technical details, see Raudenbush, Bryk, Cheong, and Congdon, 2000, pp. 207-220.

The level-1 dependent variables were students' ITBS scores, in logits (Rasch-equated ITBS scores). The units of analysis were students, nested within years, nested within schools. The principle aim of the analysis was to identify the effects of the base level of program coherence in 1994 and changes over time in program coherence on the academic achievement trends for Chicago public elementary schools. We needed to introduce adjustments for the different grade levels taught in various CPS elementary schools (at Level 1); possible time trend changes in student composition (at Level 2); and other stable school characteristics (at Level 3). The latent variable analysis also allowed us to control for differences among schools in their base year mean achievement in 1994 as we analyzed the effects of the changing levels of program coherence on schools' test score trends. The specifics of the analysis model are detailed below.

Level 1 (students)

$$Y_{ijk} = \pi_{0jk} + \pi_{1jk}\,(\text{Grade 2}) + \pi_{2jk}\,(\text{Grade 3}) + \pi_{3jk}\,(\text{Grade 4}) + \pi_{4jk}\,(\text{Grade 6}) + \pi_{5jk}\,(\text{Grade 7}) + \pi_{6jk}\,(\text{Grade 8 dummy}) + e_{ijk}$$

Where Y_{ijk} = the ITBS score of student i in year j in school k. (j = 1993 . . . 1997).

π_{0jk} = the average ITBS score of school k in year j, controlling for the percentage of students in each grade at the school that year.

$\pi_{1jk} \ldots \pi_{6jk}$ = the average difference in ITBS scores of each grade compared to fifth grade, fixed across schools.

e_{ijk} = the unique error associated with student i (i.e., how student i is different from other students in his grade in his school in year j).

The purpose of the level-1 model is to develop an estimate of mean achievement for each school for each year that can be fairly compared to other schools, regardless of the grade levels served at the school. This model takes into account the percentage of students at each grade level and produces an adjusted mean that is independent of the school's grade level composition. In this model, each student's score is predicted with dummy variables representing the different grade levels (grades two through eight, with fifth grade as the excluded group). The dummy variables are grand-mean centered and their effects are fixed. As a result, the intercept from the level-1 model, π_{0jk}, represents the adjusted mean student achievement for school k in year j, controlling for the percentage of students at each grade level in that school in that year. The intercept from the level-1 model becomes the key dependent variable in the level-2 model below.

Level 2 (years)

$$\pi_{0jk} = \beta_{00k} + \beta_{01k}\,(\text{Year}) + \beta_{02}\,(\%\ \text{Low Income Students}) + R_{0jk}$$

Where β_{00k} = the adjusted mean ITBS score for school k in 1994.
β_{01k} = the average yearly growth in mean ITBS scores in school k from 1993-1997.
β_{02k} = the relationship between percent low-income students and school mean ITBS scores, fixed across schools.

At Level 2 we are primarily interested in producing estimates of the yearly change in average achievement for each school. The π_{0jk} from the level-1 model are predicted with a linear variable representing the year, and another representing the percentage of low-income students in the school that year. The year variable discerns the time trend in mean achievement for that school. The year variable was centered around 1994, where 1993=-1, 1994=0, 1995=1, etc., so that the intercept, β_{00k} of the equation represents average achievement for school k in 1994, and the coefficient for the year variable represents the average yearly change in mean achievement in school k from 1993 to 1997. The year prior to 1994 is included as a base year so that any change in achievement that had begun to occur prior to measurement of coherence could be controlled for the analysis.

One time-varying demographic variable, percentage of low-income students, was entered at Level 2 to capture large socio-economic changes in the student body that might have occurred across the years. Other demographic variables were entered as controls at Level 3 as they were measured on only one occasion, at the same time as the initial measurement of school coherence, 1994.

The coefficients from the grade level dummy variables at Level 1($\pi_{1jk} \ldots \pi_{6jk}$) were also predicted with the year variable so that scores would not be influenced by possible trends in student performance that differed by grade level (e.g., $\pi_{1jk} = \beta_{10k} + \beta_{11k}$ *Year). These effects were fixed across schools.

Level 3 (schools)

$$\beta_{00k} = \gamma_{000} + \gamma_{001}\,(\text{coherence in '94}) + \gamma_{002}\,(\text{mean student SES}) + \gamma_{003}\,(\text{African-American school}) + \gamma_{004}\,(\text{Latino school}) + \gamma_{005}\,(\text{mixed minority school}) + \gamma_{006}\,(\text{integrated school}) + \gamma_{007}\,(\text{school size}) + \gamma_{008}\,(\text{mobility rate}) + \gamma_{009}\,(\text{change in coherence 1994 - 1997}) + U_{0k}$$

$$\beta_{01k} = \gamma_{010} + \gamma_{011}\,(\text{coherence in '94}) + \gamma_{012}\,(\text{mean student SES}) + \gamma_{013}\,(\text{African-American school}) + \gamma_{014}\,(\text{Latino school}) + \gamma_{015}\,(\text{mixed minority school}) + \gamma_{016}\,(\text{integrated school}) + \gamma_{017}\,(\text{school size}) + \gamma_{018}\,(\text{mobility rate}) + \gamma_{019}\,(\text{change in coherence 1994 - 1997}) + \gamma_{0110}(\beta_{00k}) + U_{1k}$$

At Level 3, the intercept, β_{00k}, and the slope associated with the year variable, β_{01k}, from the level-2 models were predicted with variables representing the level of coherence in the school in 1994, change in coherence from 1994 to 1997, and demographic variables.

To examine the relationship between change in instructional program coherence and change in mean ITBS scores, the coefficient of primary interest is γ_{019}. Because average growth in school achievement may depend on student achievement levels in the base year, the latent adjusted mean 1994 achievement in school k, β_{00k}, was entered as a predictor in the HLM model for the achievement trend (β_{01k}). In this way, γ_{019} represents the relationship between change in coherence and yearly growth in school mean ITBS scores, controlling for both the base coherence level in the school and the base achievement level of the school in 1994. The control for 1994 achievement may result in a conservative estimate of the relationship between change in coherence and change in school improvement. However, this allows us to be sure that any observed relationship is not due either to a relationship between school achievement in the base period and coherence change (i.e., it might be more difficult for low-achieving schools to show improvement in school coherence), or to improvement in test scores that began prior to the first measurement of school coherence.

Notes

Endnotes

[1] Throughout the report, all names of schools, individuals, and school improvement organizations in Chicago are pseudonyms used to protect the rights of human subjects. The information about Travis was previously reported in Bryk, Sebring, Kerbow, Rollow, and Easton (1998), pp. 113-114. It also reflects the experience of several schools we studied in the Chicago Annenberg Research Project.

[2] This idea was first introduced in Bryk, et al. (1993) and elaborated in Bryk, Sebring, et al. (1998).

[3] Several studies of school reform have concluded that unrelated, episodic programs undermine schools' capacity to boost student achievement (e.g. Allington and Johnson, 1989; Cohen, 1995; O'Day et al., 1995; Newmann and Wehlage, 1995; Cohen and Ball, 1996; Hill and Celio, 1998; Smylie, et al., 1998). There has not been much empirical research on the effects of program coherence on student achievement, but Allington and Johnson (1989) cited two studies showing that more effective remedial reading programs were characterized by coordination. A recent report prepared for the Chicago Board of Education and the Illinois State Board of Education (Carlson, Shagle-Shah and Ramirez, 1999) included aspects of instructional program coherence in strategies for increasing academic achievement.

[4] The framework of supports evolved through analysis within the Chicago Annenberg Research Project. It draws largely on conceptualizations advanced in Bryk, Lee, and Smith (1990), Bryk, Easton, et al. (1993), and Newmann and Wehlage (1995). It has been informed by consultation in Chicago with local researchers, principals, teachers, Local School Council (LSC) members, advocacy group representatives, and staff from the central office that led to a Chicago Public Schools document, "Children First: Self-Analysis Guide" (1995), which is the framework for annual school improvement planning in Chicago. Earlier versions of this framework served as the basis for individual school reports by the Consortium on Chicago School Research.

[5] Cunningham and Allington (1999).

[6] Slavin et al. (1996).

[7] For example, after being introduced to a new teaching strategy or curriculum unit (as in a half-day workshop), teachers have several subsequent opportunities to critically examine it, to implement it in their classrooms, and to receive feedback from colleagues and outside "experts." The new strategy becomes a focus for discussion in grade-level meetings and/or department meetings for several weeks or even years.

[8] These conclusions on conditions that maximize learning are supported in summaries of research on cognition and learning (Greeno, Collins, and Resnick, 1996; Mayer and Wittrock, M. C., 1996; Bransford, Brown, and Cocking, 1999).

[9] The importance of integrated activity is supported by Kanfer's (1990) summary of research on intrinsic motivation in the workplace, which emphasizes sense of mastery and control as critical psychological states affected by the work environment, and by Blauner's (1964) earlier analysis of worker alienation. These conclusions are consistent with summaries of research on student motivation to learn (Pittman, 1998), and of research on alienation relevant to student engagement in school (Newmann, 1981).

[10] For example, see Lawler (1990), Wohlstetter, Smyer, and Mohrman (1994).

[11] See respectively, Consortium on Productivity in the Schools (1995), Pallas and Newman (1995), Purkey and Smith (1983), King and Newmann (2000), Bryk, Lee, and Holland (1993), Chubb and Moe (1990).

[12] The data available for analysis of instructional program coherence did not permit measurement of all of the criteria discussed on pages 9 and 10. Not surprisingly, the conceptualization of instructional program coherence continued to develop as our analytical work proceeded. The specific indicators that were used for the field research and survey analyses are described in the sidebar, "How We Did the Study" and Figure 1.

[13] The coefficient for the relationship between yearly change in coherence (on a 10-point scale) and average achievement trend (in logits) was .012 in reading and .014 in math. We were interested in the change over a three-year period, 1994 to 1997, so we multiplied the effect size by 3. For ease of interpretation, logits were changed to "years of learning," with one year of learning calculated as .6 logits.

We note that schoolwide instructional program coherence may be more important to student achievement in elementary schools than high schools. In high schools, coherence within subject areas (mathematics, science, history, literature) could be more important to student learning than having a common instructional framework across subjects. This report, intended as an initial elaboration and

investigation of program coherence, is restricted to elementary schools. We hope that future research will investigate the importance of schoolwide instructional coherence at different levels of schooling and within subject areas or grade levels.

[14] Facilitator A interview/Chelsea 6/97.

[15] Literacy Coordinator B interview/Chelsea 6/97.

[16] Principal interview/Chelsea 6/97.

[17] Teachers C and D interviews/Ackerman 3/97.

[18] Direct Instruction is a commercially published program of highly-structured instruction designed to accelerate the learning of at-risk students. Key program features are a fully-sequenced, K-6 curriculum; scripted lesson plans; rapid-paced, teacher-directed instruction; frequent assessment; and students grouped by achievement. See Adams and Engelmann (1996), and Gersten, et al. (1988a, b), and American Federation of Teachers (1998).

[19] Teacher A interview/Ackerman 3/97.

[20] Teacher B interview/Ackerman 3/97.

[21] AP interview, Teacher A interview/Ackerman 3/97.

[22] Teacher A interview/Wilson 4/97.

[23] Teacher B interview/Wilson 4/97.

[24] AP interview/Wilson 4/97.

[25] Teacher E/Wilson 4/97.

[26] Teacher F/Wilson 4/97.

[27] Teacher E/Wilson 4/97.

[28] Principal interview/Chelsea 6/97.

[29] Principal interview/Sparrow 2/9/97.

[30] Teacher interview/Sparrow 2/4/97.

[31] Teacher A interview/Bishop 2/97.

[32] Teacher B interview/Bishop 2/97.

[33] Teacher A interview/Bishop 2/97.

[34] As other research and reports of the Consortium on Chicago School Research have shown, productive school improvement requires attention to several supports for student learning in addition to instructional program coherence. For example, see Bryk, et al. (1993, 1998); Newmann and Sconzert (2000); Newmann and Wehlage (1995); Smylie, Wenzel, et al. (in press).

[35] Principal interview/Chelsea 6/97.

[36] Schools varied in the number of external partners they worked with and in how well partners coordinated their efforts within a school. For more information on how external partners worked with schools, see Newmann and Sconzert (2000).

[37] Principal interview /Templeton 5/97.

[38] Principal interview/Bishop 2/97.

[39] Newmann, Lopez, and Bryk (1998) made the case for more authentic and challenging intellectual work in schools and described how teacher assignments and student work in Chicago schools met these standards.

[40] Much of the material in this section reflects conclusions in King and Newmann (1999).

[41] Some publishers offer coordinated instructional materials for individual subjects, for example series that provide a fairly comprehensive and integrated K-6 program of language arts curriculum, instruction, and assessment. However, integration of instructional approaches across subjects is rare.

[42] Allington and Johnson (1989), Bryk, et al. (1993), Cohen (1995), O'Day, et al. (1995), Hess (1999).

[43] These observations on how centralization, federalization, and fragmentation lead to complexity in school organizations come from the summary of literature offered by Scott and Meyer (1994).

[44] Examples of forces in the external system that pose difficulties for external partners working with schools are described in Newmann and Sconzert (2000).

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This report reflects the interpretations of the authors. Although the Consortium's Steering Committee provided technical advice, no formal endorsement by these individuals, their organizations, or the full Consortium should be assumed.

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Consortium on Chicago School Research

Mission

The Consortium on Chicago School Research is an independent federation of Chicago area organizations that conducts research on ways to improve Chicago's public schools and assess the progress of school improvement and reform. Formed in 1990, it is a multipartisan organization that includes faculty from area universities, leadership from the Chicago Public Schools, the Chicago Teachers Union, education advocacy groups, the Illinois State Board of Education, and the North Central Regional Educational Laboratory, as well as other key civic and professional leaders.

The Consortium does not argue a particular policy position. Rather, it believes that good policy is most likely to result from a genuine competition of ideas informed by the best evidence that can be obtained.

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Improving Chicago's Schools

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The Chicago Annenberg Research Project is a five-year program of the Consortium on Chicago School Research to document and analyze the activities and accomplishments of the Chicago Annenberg Challenge. The project focuses on four related areas of inquiry.

1. **Outcomes for students.** Change in academic achievement, including basic skills and higher levels of learning. Also change in social attitudes, conduct, and engagement among students in Annenberg schools.

2. **School development.** Improvement in key organizational conditions of Annenberg schools that affect student learning. These conditions include school leadership, parent and community partnerships, student-centered learning climate, professional development and community, and quality instruction, as well as the Challenge's organizational themes of time, size, and isolation.

3. **Networks.** How networks, their external partners, and other change mechanisms promote the development of Annenberg schools.

4. **Larger contexts needed to support school development.** How the Challenge develops as an organization to support networks and school development. How the broader institutional contexts of Chicago affect the development and accomplishments of the Challenge.

The project's research design includes longitudinal surveys and case studies, multiple levels of analysis, and comparison groups. Data are collected from several sources including surveys of teachers, principals, and students; observations of schools and classrooms; classroom tasks and student work products; interviews; documents of Challenge activities; and administrative records from the Chicago Public Schools.